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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,833	02/25/2002	Stephen M. Graves	P00079US2A	4638

7590 04/27/2009
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EXAMINER

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ART UNIT	PAPER NUMBER
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2874

MAIL DATE	DELIVERY MODE
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04/27/2009

PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEPHEN M. GRAVES
and MINORU ISHIHARADA

Appeal 2009-1152
Application 10/082,833
Technology Center 2800

Decided:¹ April 27, 2009

Before MAHSHID D. SAADAT, JOHN A. JEFFERY, and
THOMAS S. HAHN, *Administrative Patent Judges*.

HAHN, *Administrative Patent Judge*.

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from the Examiner's rejections of claims 15-38, 40, 41, 43, and 44. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

STATEMENT OF THE CASE

Appellants invented an optical delineation marking method and apparatus for use along a travel path or road. The delineation marking is configured to outline at least a portion of the path or road contour, and includes a substantially transparent elongated optical transmission tube. A light source is located at one end of the optical tube, and a reflective layer extends along at least a portion of the optical tube.² Claim 15 is illustrative:

15. A delineation marking arrangement for use along a road, the delineation marking arrangement comprising:

a delineation marker configured to outline at least a portion of the contour of the road; and

at least one optical transmission tube assembly disposed on the delineation marker, the optical transmission tube assembly being configured to be visibly detected by a vehicle driver to convey road-related information to the vehicle driver. [sic]

wherein the optical transmission tube assembly includes:

an elongated body that is substantially transparent,

² See generally Spec. 7:3-26; 12:13-17, 28-33; Figs. 13, 14.

a reflective layer extending along at least a portion of the length of the elongated body, and

a light source provided at an end portion of the elongated body.³

The Examiner relies on the following prior art references to show unpatentability:

Sugiyama	US 5,982,969	Nov. 9, 1999
Tribelsky	US 6,592,245 B1	July 15, 2003 (eff. filed Aug. 6, 1999)

The Examiner rejected claims 15-38, 40, 41, 43 and 44 under 35 U.S.C. § 103(a) as unpatentable over Sugiyama and Tribelsky (Ans. 3-5).

Rather than repeat the arguments of Appellants or of the Examiner, we refer to the Briefs and the Answer⁴ for their respective details. In this decision, we have considered only those arguments actually made by Appellants. Arguments that Appellants could have made but did not make

³ An amendment filed on Nov. 15, 2004 introduced new limitations after the period of original claim 15, which original period was not marked for deletion. The Examiner indicates in the Final Action mailed Feb. 7, 2005 that claim 15 was “reconsidered in view of the amendment” (Final Rej. 2), and Appellants indicate that no amendments have been filed subsequent to the mailing of the Final Action (App. Br. 4). Thus, claim 15 has been examined with the included erroneous period. For purposes of this decision, we deem the error harmless.

⁴ We, therefore, refer throughout this opinion to the Answer mailed Mar. 10, 2006, the Reply Brief filed May 15, 2006, and the Amended Appeal Brief filed Sept. 4, 2008.

in their Brief have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

Appellants' Arguments

Appellants assert that Tribelsky (1) “expressly teaches away from the use of light guides having short length” by teaching “a single light source and optical fiber assembly . . . used to illuminate a barrier of more than two kilometers in length (col. 7, lines 61-64)” (App. Br. 8); (2) “teaches away from the use of an LED” by “disclos[ing] a long light guide that requires a high intensity light source (col. 5, lines 40-43)” (*Id.*); (3) teaches away from employing a reflective strip by disclosing “a light guide including side emitting optical fibers that transmit light via total internal reflection (col. 4, lines 64-67)” (App. Br. 10); (4) fails to teach “an optical transmission tube having an elongated body that is substantially transparent” (App. Br. 12); and (5) “does not teach the use of a single fiber to delineate a contour in a road, . . . [and the taught] fiber with a maximum diameter of one millimeter would be ill-suited to delineate a portion of a road” (Reply Br. 8). With respect to combining Tribelsky and Sugiyama, Appellants assert that “the reflective strip of Sugiyama . . . would serve no function if applied to the light guide of Tribelsky . . .” (App. Br. 10).

ISSUE

Have Appellants shown the Examiner erred in combining Tribelsky and Sugiyama under § 103 to arrive at the claimed invention? The issue turns on whether (1) the Examiner provides reasoning and some rational underpinning for combining the references, and (2) an ordinarily skilled

artisan would recognize that the Tribelsky taught optical road marking system would be improved with the Sugiyama taught optical transmission tube.

FINDINGS OF FACT

The record supports the following Findings of Fact (FF) by a preponderance of the evidence:

1. Appellants' Specification discloses that optical transmission tubes for the disclosed road delineation marking arrangement are those types of optical transmission tube devices having an included longitudinally extending reflecting layer as is disclosed by Sugiyama, which is incorporated in the Specification by reference (Spec., 3:3-4; 7:25-26).
2. Tribelsky discloses a method and apparatus for optically marking a path, such as marking center line guard rails for a road, with a side emitting optic fiber within a flexible semi-opaque holographically-grooved sleeve (Tribelsky, Abstract; col. 2, ll. 53-62; Fig. 6 (reproduced below for reference)).

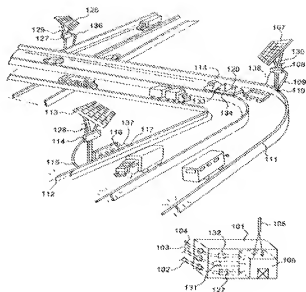


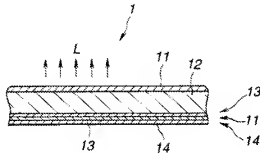
FIG. 6

Tribelsky's Figure 6 depicts a perspective view of a road optically marked with light guides 111 and 112

3. Tribelsky further discloses that the side emitting optical fiber for the disclosed path or road marking is any optical fiber that will transmit a desired frequency of light from one end to the other (using internal reflection of the fiber(s)), and also allow some portion of the transmitted light to escape from the fiber during the transmission along the length (Tribelsky, col. 5, ll. 59-67).
4. Sugiyama discloses a method for making an optical transmission tube apparatus having a transparent core 12 inside a coaxial cladding 11 with a reflecting layer 13 positioned between the cladding 11 and core 12 and along a length of the optical transmission tube 1. Light (L) from a source, which may be a light emitting diode (LED), is passed through the core 12, and is reflected and scattered by the reflecting layer 13 so as to emerge approximately opposite the reflecting layer

13 (Sugiyama, col. 4, ll. 25-47; col. 7, ll. 60-62; Fig. 1 (reproduced below for reference)).

FIG. 1



Sugiyama's Figure 1 depicts sectional view of an optical transmission tube with reflecting layer

5. Sugiyama further discloses that the optical transmission tube can be used to provide linear luminous bands for indicating crossing gates, stop lines, and also linear luminous bands for height limits of overhead beams for parking inlets (Sugiyama, col. 13, ll. 26-37).

PRINCIPLES OF LAW

An Examiner rejecting claims under 35 U.S.C. § 103 must establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966).

The question of obviousness of claimed subject matter involving a combination of known elements is addressed in *KSR Int'l v. Teleflex, Inc.*, 550 U.S. 398 (2007), which explains:

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Sakraida* [v. *AG Pro, Inc.*, 425 U.S. 273 (1976)] and *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57 (1969)] are illustrative—a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

KSR, 550 U.S. at 417.

If the claimed subject matter cannot be fairly characterized as involving the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement, a holding of obviousness can be based on a showing that “there was an apparent reason to combine the known elements in the fashion claimed.” *Id.* at 418. Such a showing requires

“some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”. . . . [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

Id. at 418 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

ANALYSIS

Obviousness Rejection over Tribelsky and Sugiyama

Claims 15-20, 22-26, and 43

Based on the record, we are not persuaded that the Examiner erred in rejecting representative claim 15 over the combined references.⁵

The Examiner finds that Tribelsky discloses a road delineation marker that is an optical device (Ans. 3-4). We concur with these findings (*see* FF 2). The Examiner continues that Tribelsky, however, does not teach “use of a reflective layer in a strip form” with the disclosed optical device, but that “Sugiyama explicitly teaches . . . a strip of light reflective layer in a side emitting optical fiber device (Figs. 1-2; column 4 lines 30-31; column 7 line 62; column 4 line 65)” (Ans. 3-4). We also concur in these findings from Sugiyama (*see* FF 4).

With respect to combining Tribelsky and Sugiyama, the Examiner indicates that:

Sugiyama explains that the prior art side emitting optical transmission tubes lack desirable qualities, and that Sugiyama’s configuration is advantageous and desirable because it allows for optical transmission tube with improved environmental resistance, and low operating power consumption (column 1 line 7-column 2 line 30). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the device of Tribelsky to have a reflective strip layer and a light emitting diode as a light source as taught in Sugiyama.

⁵ Appellants’ arguments are directed to independent claim 15. Dependent claims 16-20, 22-26, and 43 are not separately argued (App. Br. 6-8, 10-12). Accordingly, we select independent claim 15 as representative of this group. *See* 37 C.F.R. § 41.37 (c)(1)(vii).

(Ans. 4-5). We deem this reasoning as providing some rational underpinning for combining the references.

We, moreover, find that Tribelsky discloses:

For purposes of the [taught] invention a “side emitting optical fiber” is *any optical fiber* which will transmit a desired frequency of light from one end to the other (using internal reflection of the fiber/s), and simultaneously allows some portion of the transmitted light to escape from the fiber during the transmission along the length

(Col. 5, ll. 59-67; FF 3) (emphasis added). We additionally find that Sugiyama discloses that the taught optical transmission tube can be used to provide linear luminous bands for indicating crossing gates, stop lines, and also linear luminous bands for height limits of overhead beams for parking inlets (FF 5). Thus, Tribelsky discloses that other side emitting optical fibers can be used for road marking, and Sugiyama discloses both a side emitting optical fiber, and that this side emitting optical fiber can be used for marking road traffic locations (FF 3-5).

Accordingly, we deem that there is appropriate rational underpinning that supports modifying Tribelsky with Sugiyama’s optical transmission tube that has an internal reflecting layer. *See KSR*, 550 U.S. at 418.

Appellants argue Tribelsky teaches away from optical fibers including a reflective strip (App. Br. 10-12; Reply Br. 6-8), and also teaches away from use of a substantially transparent transmission tube (App. Br. 12; Reply Br. 8-9). Appellants’ arguments, however, solely are grounded in assertions regarding modifying Tribelsky’s side emitting optical fibers with Sugiyama. Appellants do not argue that Tribelsky teaches away from using optical fibers other than the Tribelsky’s optical fibers, including other optical fibers with reflective strips and substantially transparent transmission tubes.

Indeed, Tribelsky discloses that, with respect to the disclosed road marking system, a “‘side emitting optical fiber’ is *any optical fiber* which will transmit . . . light . . . and simultaneously allow[] some portion of the light to escape . . . ” (FF 3) (emphasis added). Furthermore, Appellants’ own Specification reveals that Sugiyama’s optical transmission tube devices are used for the road delineation marking arrangement of the present invention (FF 1). This acknowledgement from Appellants’ Specification is an admission that *prior art* side emitting fiber devices other than that taught by Tribelsky are useable for road marking. Accordingly, Appellants’ arguments, at best, are restricted to assertions that Tribelsky teaches away from modifying Tribelsky’s side-emitting optical fibers, not from modifying Tribelsky’s road marking system with Sugiyama’s optical transmission tube.

We deem from the record, however, that Sugiyama’s optical transmission tube would have been recognized by ordinarily skilled artisans as an improved device for Tribelsky’s road marking system. Tribelsky discloses that other side-emitting optical fibers using internal fiber reflection can be used for road marking (FF 3). Sugiyama’s optical transmission tube can be used for marking road traffic locations (FF 5). This record, we are persuaded, shows that an ordinarily skilled artisan would recognize modification of Tribelsky’s road marking system with Sugiyama’s optical transmission tube as a predictable use of prior art elements according to their established functions. *See KSR*, 550 U.S. at 417.

We therefore find that Appellants have not persuasively rebutted the Examiner’s *prima facie* case of obviousness based on the collective teachings of Tribelsky and Sugiyama under § 103.

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner's rejection of representative claim 15. Therefore, we will sustain the Examiner's rejection of claim 15, and claims 16-20, 22-26, and 43 that fall with claim 15.

Claim 21

Based on the record, we are not persuaded that the Examiner erred in rejecting claim 21 over the combined references. Claim 21 is dependent from claim 15, and recites that "the light source includes a light emitting diode."

Appellants argue that Tribelsky teaches away from use of a LED as a light source (App. Br. 8-10; Reply Br. 4-6), because of the Tribelsky "disclosure . . . directed to long light guides (col. 3, lines 37-38)" such as "of more than two kilometers in length (col. 7, lines 61-64)" (App. Br. 8-9). Therefore, according to Appellants, "a high intensity light source is required to maintain uniform illumination," and "[t]he LED of Sugiyama '969 is a low-intensity light source that is unsuitable for illuminating the elongated path of Tribelsky '245" (App. Br. 9). In response, the Examiner indicates that "[t]he actual teaching of the invention is NOT limited to long length optical fibers, and other examples of optical fibers involve much shorter length (such as lengths suitable for stop signs)" (Ans. 5-6).

Neither claim 21 nor any other appealed claim recites any limitation that the optical transmission tube must be equal to or less than any specified length. Further, we deem that Tribelsky in disclosing that "a 'side emitting optical fiber' is any optical fiber" (FF 3) at least suggests that any appropriate light source for any such alternative optical fiber also is appropriate. Moreover, Tribelsky does not disclose that light sources for

side emitting fibers cannot be LEDs. Turning to Sugiyama, we note that the light source for the optical transmission tube is a LED (FF 4), and that this optical transmission tube with LED light source is disclosed as being usable for marking road traffic locations (FF 5).

On the record before us, we therefore find that Appellants have not persuasively rebutted the Examiner's prima facie case of obviousness.

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner's rejection of representative claim 21. Therefore, we will sustain the Examiner's rejection of claim 21.

Claims 27-33

Based on the record, we are not persuaded that the Examiner erred in rejecting representative claim 27 over the combined references.⁶

Appellants reiterate arguments made with respect to claims 15 and 21 (App. Br. 6-10, 12). For the reasons indicated previously, we are not persuaded by these arguments.

Accordingly, Appellants have not persuaded us of error in the Examiner's rejection of representative claim 27. Therefore, we will sustain the Examiner's rejection of that claim, and claims 28-33 that fall with claim 27.

⁶ Appellants' arguments are directed to independent claim 27. Dependent claims 28-33 are not separately argued (App. Br. 6-10, 12). Accordingly, we select independent claim 27 as representative of this group. See 37 C.F.R. § 41.37 (c)(1)(vii).

Claim 34-38 and 40

Based on the record, we are not persuaded that the Examiner erred in rejecting representative claim 34 over the combined references.⁷

Appellants reiterate arguments made with respect to claims 15, 21, and 27 (App. Br. 6-10, 12). For the reasons indicated previously, we are not persuaded by these arguments.

Accordingly, Appellants have not persuaded us of error in the Examiner's rejection of representative claim 34. Therefore, we will sustain the Examiner's rejection of that claim, and claims 35-38 and 40 that fall with claim 34.

Claims 41, 43, and 44

Based on the record, we are not persuaded that the Examiner erred in rejecting representative claim 41 over the combined references.⁸

Appellants reiterate arguments made with respect to claims 15, 21, 27, and 34 (App. Br. 6-12). For the reasons indicated previously, we are not persuaded by these arguments.

Accordingly, Appellants have not persuaded us of error in the Examiner's rejection of representative claim 41. Therefore, we will sustain

⁷ Appellants' arguments are directed to independent claim 34. Dependent claims 35-38 and 40 are not separately argued (App. Br. 6-10, 12). Accordingly, we select independent claim 34 as representative of this group. See 37 C.F.R. § 41.37 (c)(1)(vii).

⁸ Appellants' arguments are directed to independent claim 41. Dependent claims 43 and 44 are not separately argued (App. Br. 6-10, 12). Accordingly, we select independent claim 41 as representative of this group. See 37 C.F.R. § 41.37 (c)(1)(vii).

the Examiner's rejection of that claim, and claims 43 and 44 that fall with claim 41.

CONCLUSIONS OF LAW

Appellants have not shown that the Examiner erred in rejecting claims 15-38, 40, 41, 43, and 44, under § 103. Nor have Appellants shown that the Examiner erred in combining Tribelsky and Sugiyama, which collectively teach and suggest modifying the Tribelsky taught road marking system with the Sugiyama taught optical transmission tube.

ORDER

The Examiner's decision rejecting claims 15-38, 40, 41, 43, and 44 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

ELD

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